

Exam Review #3

- 1) Simplify the following as a single power with a positive exponent using the exponent laws. Do not give decimal answers.

a) $\frac{a^5}{a^3} = a^{5-3} = a^2$

b) $(d^4)^2 = d^8$

c) $z^{-3} = \frac{1}{z^3}$

d) $\frac{m^3}{m^9} = m^{3-9} = m^{-6} = \frac{1}{m^6}$

e) $32^{-\frac{2}{5}} = \frac{1}{\sqrt[5]{32^2}}$

f) $4^{-2} + 4^2 + 4^0 = \frac{1}{4^2} + 4^2 + 1 = \frac{1}{16} + 16 + 1 = \frac{1}{16} + 17 = \frac{272}{16}$

g) $(-64)^{\frac{1}{3}} = \sqrt[3]{-64}$

h) $[a^6(a^{-4})^2]^{-5} = [a^6(a^{-8})]^{-5} = [a^{6+(-8)}]^{-5} = [a^{-2}]^{-5} = a^{-2 \times -5} = a^{10}$

i) $(3x^2y^4)(-4xy^2) = -12x^3y^6$

- 2) For the equations, tables, and graphs below indicate if they are linear, quadratic or exponential.

a) $y = \frac{1}{2}x + 5$

linear

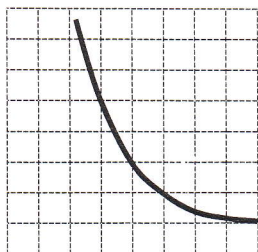
b) $y = \left(\frac{3}{7}\right)^x$

exponential

c) $y = \frac{x^2}{4} - 7$

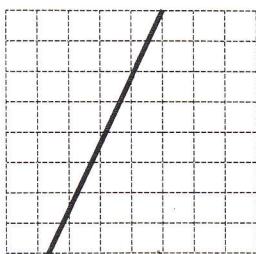
quadratic

d)



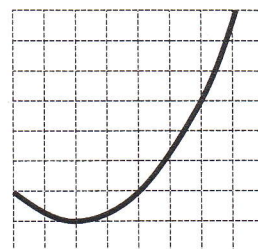
exponential

e)



linear

f)



quadratic

g)

h)

i)

quadratic

x	y	1 st	2 nd
-3	0.5		
-2	2	1.5	
-1	4.5	2.5	1
0	8	3.5	1
1	12.5	4.5	1
2	18	5.5	1
3	24.5	6.5	

linear

x	y	1 st	2 nd
-3	3.5		
-2	8	4.5	
-1	12.5	4.5	
0	17	4.5	
1	21.5	4.5	
2	26	4.5	
3	30.5	4.5	

exponential

x	y	1 st	2 nd
-3	0.125		
-2	0.25	0.125	
-1	0.5	0.25	0.125
0	1	0.5	0.25
1	2	1	0.5
2	4	2	1
3	8	4	2

1. J.D deposits \$750 in a simple interest savings account that earns 3.5%.

a) How much interest will Phil earn after 5 years?

$$I = 750 \times 0.035 \times 5$$

$$= 131.25$$

∴ Phil will earn
\$131.25 in interest

2. Elliot needs \$7000 for university in 4 years. Her parents plan to invest some money in an account paying interest at a rate of 6.4%/a compounded quarterly. How much should they invest so that they have \$7000 in four years?

$$7000 = P \left(1 + \frac{0.064}{4} \right)^{16}$$

$$P = \frac{7000}{\left(1 + \frac{0.064}{4} \right)^{16}}$$

$$P = 5429.99$$

∴ they need to
invest \$5429.99

3. Carla made \$2500 working during the summer. She plans on investing the \$2500 in an account compounded monthly. She wants to have \$3005 in three years for a trip to Europe. What annual interest rate, to the nearest hundredth of a percent, compounded monthly, does she need?

$$\frac{3005}{2500} = \frac{2500}{2500} (1 + i)^{36}$$

$$1.202 = (1 + i)^{36}$$

$$\sqrt[36]{1.202} = 1 + i$$

$$1.005123828 = 1 + i$$

$$1.005123828 - 1 = i$$

$$i = 0.005123827$$

$$\times 12$$

$$i = 0.061485931$$

$$\times 100$$

$$i = 6.15\%$$

4. Approximately (no decimals) how long would it take for a \$25000 investment to double if it earns 14%/a interest compounded semi-annually?

$$\frac{50000}{25000} = \frac{25000}{25000} \left(1 + \frac{0.14}{2}\right)^n$$

$$n = 5.12$$

∴ approx 5 years

$$2 = (1.07)^n$$

$$n = \frac{\log 2}{\log 1.07}$$

$$n = 10.24476835 \div 2$$

5. Turk plans to deposit \$875 every 3 months for 5 years. With an investment rate of 6%/a compounded quarterly, how much will Turk have in his account in five years?

$$\begin{aligned} A &= R \frac{[(1+i)^n - 1]}{i} \\ &= 875 \frac{[(1 + \frac{0.06}{4})^{20} - 1]}{0.06/4} \\ &= 20233.21 \end{aligned}$$

∴ Turk will have
\$20233.21

6. Jordan wants to receive \$6000 every 6 months, for 5 years for living expenses when she goes back to school. How much must she invest now at 5.5%/a compounded semi-annually?

$$\begin{aligned} PV &= R \frac{[1 - (1+i)^{-n}]}{i} \\ PV &= 6000 \frac{[1 - (1 + \frac{0.055}{2})^{-10}]}{\frac{0.055}{2}} \\ PV &= 51840.46 \end{aligned}$$

∴ she must invest
\$51840.46 now.